Stability limits for three-dimensional vortex solitons in the Ginzburg-Landau equation with the cubic-quintic nonlinearity

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Résumé en anglais	We complete the stability analysis for three-dimensional dissipative solitons with intrinsic vorticity S in the complex Ginzburg-Landau equation with cubic and quintic terms in its dissipative and conservative parts. It is found and qualitatively explained that a necessary stability condition for all vortex solitons, but not for the fundamental ones (S=0), is the presence of nonzero diffusivity in the transverse plane. The fundamental solitons are stable in all cases when they exist, while the vortex solitons are stable only in a part of their existence domain. However, the spectral filtering (i.e., the temporal-domain diffusivity) is not necessary for the stability of any species of dissipative solitons. In addition to the recently studied solitons with S=0,1,2, a stability region is also found for ones with S=3.
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